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ABSTRACT

This booklet describes and discusses a method for determining the readability level of prose passages in reading materials for children. The method discussed in the booklet assigns a value to each noun in selected passages on the basis of its frequency level on standard word-frequency charts, correlated in a number of studies with independent estimates of the difficulty of reading passages. Comparisons are made with other readability estimates, and strengths and weaknesses of the noun-frequency method are discussed in the booklet. An appendix lists 2,050 nouns graded by frequency of use in free writing of New Zealand primary school children. (MG)

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REVISED EDITION

Assessing the Difficulty of Reading Materials:

THE NOUN FREQUENCY METHOD

Warwick B. Elley and A. Cedric Croft

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ASSESSING THE DIFFICULTY OF READING MATERIALS: THE NOUN FREQUENCY METHOD

Revised Edition

Warwick B. Elley and A. Cedric Croft

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New Zealand Council for Educational Research
Wellington, 1989

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Contents

		Page
	Preface	5
I	**Introduction** Rationale Word Frequency Counts Revised List of Nouns	7
II	**Procedure** Worked Example	11
III	**Evaluation of the Method** Other Word Frequency Lists Recent Validity Studies Computer Applications	14
IV	**Conclusions and Cautions**	23
V	**References**	24
VI	**Appendix** Revised List of Nouns Graded by Frequency of Use	27

List of Tables

		Page
Table 1	Cloze Test Completions Classified by Part of Speech	9
Table 2	Suitable Age Levels for Readability Ratings Obtained from Noun Counts	14
Table 3	Rank Correlations between Judges' Criterion of Difficulty and Readability Estimates for Five Independent Studies	15
Table 4	Correlations between Noun Count Ratings and Cloze Test Difficulty on Selected Passages	17
Table 5	Correlations between Noun Count Ratings and Passage Mean Difficulty Indices of Items in Standardized Reading Tests	19
Table 6	Analysis of Variance Showing Effects of Prose Simplification on Gains in Student Comprehension	20

Preface

The original edition of *Assessing the Difficulty of Reading Materials: The Noun Frequency Method* was written by Warwick Elley in 1975. Prior to that the 'noun count', as the technique is popularly called, had been described in *Education*. The word list used for identifying common nouns was the late Gordon Arvidson's *NZCER Alphabetical Spelling Lists*. At that time this was the most comprehensive list of New Zealand children's written vocabulary, containing words graded by frequency of use. The 1975 publication extended the list of nouns to some 2000, further clarified the procedure and included a discussion of the rationale and validity of the noun frequency method.

It is perhaps not widely appreciated that the origins of the 'noun count' technique lie in the development of the *Progressive Achievement Test of Reading Comprehension* by Warwick Elley and Neil Reid. One of the initial problems faced in developing the content referencing of this test and advancing the 'level scores' concept, was to find a simple yet reliable method of measuring readability for New Zealand children. The ingenious solution, which became the cornerstone of the technique, was to regress the average frequency of nouns within each test passage on to the mean ages of a sample of children demonstrating adequate comprehension of prose passages. Although the 'noun count' technique originated as part of the test development process, it soon became clear that it would develop a life of its own.

For this first revision of *Assessing the Difficulty of Reading Materials: The Noun Frequency Method*, Warwick Elley is joined in authorship by Cedric Croft. Much of the data on which this revision is based have come from the latter's studies of the word-use of primary children, in particular those underpinning the NZCER publication *Spell-Write: An Aid to Writing, Spelling and Word Study*. As well as incorporating this new material, the revision contains an extended validity section and introduces computer versions of the noun frequency procedures, which are being developed for IBM-compatible, Apple, BBC and Commodore PC's.

The two authors have combined previously with Colin Cowie to produce *The New Zealand Basic Word List: Revision of the Dolch Basic Sight Vocabulary List*. Their backgrounds in reading, studies of children's writing vocabularies and educational measurement, make them well suited to continue the development of this very practical approach to assessing the readability of materials.

The 1975 edition of *Assessing the Difficulty of Reading Materials: The Noun Frequency Method* has proved to be a popular and valuable resource

for teachers, authors, book publishers and others who may need a quick, accurate and reliable measure of readability. I am confident that the Revised Edition will also prove popular and continue to be a widely-used professional tool.

The New Zealand Council for Educational Research is pleased to publish this work and the associated computer programs, and looks forward to continuing its important statutory function of bringing sound research-based materials to teachers at all levels of the education system.

Ian D Livingstone
Director
NZCER
June 1989

I Introduction

Simple objective methods of estimating the difficulty of reading materials for children have been sought for over half a century. In that period over 100 'systems' of measuring readability have been devised. None however, has proven to be entirely satisfactory; most are cumbersome to apply and conflicting estimates of difficulty levels are not uncommon.

Sensitive observers of children and books may in the course of time, acquire sufficient skill to require no further aids in judging the reading difficulty of a story. Nevertheless, the majority of teachers, librarians, parents, test developers, and others interested in matching books with children, have felt the need for an independent and objective method for judging readability, without having to resort to a major research investigation.

It cannot be denied that reading difficulty is only one aspect of suitability, one which must be considered along with interest level, print size, layout and pictures, as well as the purposes and competencies of the reader. The complexity of the reading task is however, an important ingredient to take account of when selecting materials for children to read. Many a young potentially interested reader has been discouraged by a needless succession of unfamiliar words and complicated constructions. Measures of vocabulary requirements and stylistic complexity can then support teachers in their efforts to entice children toward a love of books.

In the course of the development of a set of standardised tests of reading for general use in New Zealand schools, Elley (1967) investigated a range of existing, widely-used readability techniques. The hope was that one such method could be identified which would make it possible to grade reading passages according to difficulty level. This would enable teachers to draw conclusions from the standardised test results about the level of difficulty of materials that each child could be expected to comprehend adequately.

The traditional formulae proved disappointing on the whole. Generally they were time-consuming and arduous to apply and the results were by no means consistent. Therefore new approaches were investigated. Three lines of thought led to the development of the readability method which is described in the following pages.

Rationale

Firstly, it has been found in studies of verbal learning, that a strong relationship exists between the frequency with which a word occurs in writing and

its 'meaningfulness'. According to Underwood and Schulz (1960) 'the higher the meaningfulness of a verbal unit the more frequently that word has been experienced.' Apparently the words we see often are the words we rate high in meaningfulness. The psychologist's definition of meaningfulness is, of course, more akin to the layman's idea of 'association value' than to any philosophical concept of meaning, but it is reasonable to assume that the correlation between meaningfulness and difficulty level, as encountered by children, is likely to be high. Thus, an index of frequency of exposure to certain verbal units should be helpful.

Secondly, it was noted that previous studies of readability had shown vocabulary load to be a consistently good index of reading difficulty. This, despite the fact that vocabulary measures were very unrefined, classified usually on a two-point scale, as 'familiar' or 'unfamiliar'. Thus Dale and Chall (1948) showed a correlation of 0.68 between their criterion of reading difficulty and the proportion of words outside the Dale list of 3,000. This was the highest of five readability indices. Gray and Leary (1935) too, found that the number of unfamiliar words correlated more highly with their criterion than any of 21 indices investigated, and similarly promising results had been shown by Spache (1958), Lorge (1944), Forbes (1952), and Bormuth (1966). In recent reviews of readability, Harrison (1980) and Davison (1985) also made the point that vocabulary is the most important factor in determining readability. Since satisfactory results were obtained in these studies with only a *two-point scale* of vocabulary load, it was concluded that still better results would be produced with a scale which took account of *various degrees of familiarity* of the words of a passage, rated according to their frequency of occurrence.

The third line of approach to a new readability method stemmed from a study of language. Students of linguistics point out that in a sentence, certain content-bearing words carry most of the meaning of a communication, while others are used primarily to indicate relationships amongst them. Nouns, verbs, adjectives and adverbs carry the load of meaning in most communications. Relational words, such as prepositions, pronouns, articles and conjunctions, probably set fewer limits on comprehension, and are usually found in similar proportions in simple and complex prose alike. However, the rating of such words for readability analyses adds considerably to the laboriousness of the exercise, without any apparent improvement in validity. There seemed to be justification then, in limiting the classes of words to be rated to the main content-bearing words.

Preliminary and subjective analyses of complex prose passages, taken from comparatively difficult writers such as Toynbee, Galbraith, Whitehead, Thackeray and Dickens showed that their difficulty tended to reside more in the nouns than the verbs or adjectives. Added reasons for concentrating on nouns came from a 'post-hoc' analysis of a related experiment in reading comprehension. In this investigation, 70 secondary school pupils completed

a 'cloze' test of ten prose passages, each containing approximately 150 words. Each sixth word had been eliminated from the passages, and the pupils' task was to fill the blanks with the aid of the context. After marking, the results were classified by part of speech in order to determine the relative difficulty levels for each class of word (see Table 1). Clearly, nouns proved to be the most difficult class of words to replace correctly. It seems reasonable to conclude from this result, that nouns are surrounded by less redundancy than other parts of speech; their comprehension then, is more critical to an understanding of the passage.

Table 1:
Cloze Test Completions Classified by Part of Speech

	Nouns	Verbs	Prons.	Adjs.	Advs.	Conjs.	Preps.
Possible No. Correct	903	557	408	611	216	170	394
Actual No. Correct	258	403	296	318	84	101	293
% Correct	28.6	72.4	72.6	52.1	38.9	59.4	74.4

Some corroboration for this view was found in a study of more than 10,000 errors in oral reading made by 100 beginning readers. Clay (1966) showed that many of these errors are corrected from context by the children themselves. Of these self-corrections, 72% occurred in equivalent grammatical categories, and amongst these, the nouns were shown to have the lowest rate (21%), of correct substitution. Figures for other word classes were verbs (35%), adjectives (33%), prepositions (46%), and pronouns (60%). Apparently readers who cannot attach meaning to the nouns in a passage can gain little help from the context.

Thus, on the basis of these analyses of vocabulary and grammatical structure there seemed good reason to conduct empirical studies on the noun as a basis for a readability check. Nevertheless, verbs and adjectives were also examined along with nouns in the empirical studies described below.

Word Frequency Counts

To provide a convenient and accurate method of grading the nouns according to familiarity, several word frequency counts were examined for the original edition of the present text. The Dale-Chall (1948) lists, commonly used in

other studies, were considered unsuitable because they provide only two categories – familiar and unfamiliar. The Thorndike-Lorge (1944) list does have a graded scale, but it is not sufficiently discriminating amongst the high frequency words to be useful with children's reading matter. The English word list of Edwards and Gibbon (1964) is also graded, but contains fewer than 1,400 words all told, not enough for the purpose intended. Michael West's (1953) General Service List of English Words is a potentially useful list in that it classifies the words according to the frequency of occurrence of their various meanings and uses, but it too contains fewer than 2,000 words, and would be cumbersome to use. It is apparent too that all the above lists are now beginning to date. More recently, as part of this revision, the comprehensive *American Heritage Word Frequency Book* by Carroll, Davies and Richman (1971) was investigated, but was felt to be too closely linked with American school texts to be of major use in New Zealand.

In fact, as the original analysis was to show, the most useful lists were those derived from *children's own writing*, rather than from books written by adults. Amongst these were Radford's (1960) Australian word count, and the list prepared for the Board of Education of the City of New York (1954), based, in turn, on Rinsland's (1945) word count of children's writing. The New Zealand adaptation of this list, prepared by Arvidson (1961) as the *NZCER Alphabetical Spelling List, Book 2*, was felt to have the most potential for the original edition of the present text. Its 2,700 words were classified into seven levels of frequency, it was convenient to use, and suited to local conditions. To improve its discrimination at the upper end, an eighth level of 270 words, compiled by Holder (1965) was added. The list of nouns published in the original edition of this book has now been replaced by an updated list.

Revised List of Nouns

The revised list contained in the Appendix contains 2,050 nouns, graded into eight levels on the basis of frequency of occurrence in the free writing of New Zealand primary school children. The major source of data for this revision came from a national survey of primary children's writing by Croft (1983a), which formed the basis of the NZCER publication *Spell-Write: An Aid to Writing, Spelling and Word Study*. An account of the major findings of this survey is contained in Croft (1983b), and the conditions under which the samples of free writing were obtained may be found in Croft (1983c). After further analysis of the 198,854 running words from this survey, 182 nouns were deleted from Elley's original list, mostly from Levels 7 and 8. In addition, a number of words from lower levels which are used less often because of changes in social conventions, curriculum, currency, measurement, etc., were also omitted. In making the final judgements on these matters, the au-

thors were guided by the two NZCER frequency counts listed above, and other major word lists, such as the *American Heritage Word Frequency Book*, Carroll *et al.* (1972).

Examples of omissions were: acre (7), arithmetic (4), automobile (5), chores (7), elf (8), fiddle (8), igloo (7), multiplication (8), negro (7), noun (6), oats (4), ox (7), pail (6), penny (2), pier (7), pint (3), plough (6), pronoun (7), quart (3), shepherd (7), sleigh (4), thread (5), ton (8), verb (5), wag (3), wigwam (8), and yarn (8).

New words introduced in this revision reflect corresponding changes in linguistic usage, greater recognition of Maori language, the advent of computer technology and other obvious influences. Amongst the additions to the new list are: barbecue (5), cancer (4), cassette (8), cheque (8), disco (6), display (3), diver (6), gear (3), halloween (7), hui (7), junk (5), kilometre (4), laser (7), lump (2), marae (7), metre (4), monster (3), motorbike (8), pakeha (7), pitcher (5), skateboard (3), sky rocket (5), stereo (8), supermarket (6), tonne (8), tour (6), trampoline (8), trike (5), video (6), and word-processor (6).

Apart from the omissions and additions, approximately 49 per cent of the words retained from the original 1975 list have had their frequency levels amended. As would be expected, words with altered levels tend to be at or above Level 5, and the changes have rarely been more than two levels. Examples of exceptions to these two general rules are: president, moved from 3 to 6; seam and anchor, from 5 to 8; climate, from 4 to 7; price, from 6 to 2; weekend, from 8 to 6; and speaker, from 8 to 5. More typical of the smaller changes to existing levels are: beach, moved from 3 to 1, dollar, from 3 to 2; space from 6 to 4; wharf and flash from 7 to 5; writer and telescope, from 8 to 6. In the other direction typical examples are: answer, moved from 2 to 3; candy, from 3 to 5; museum, from 3 to 4; character and member, from 6 to 7; kindness and leather, from 5 to 7; flock and grammar, from 7 to 8; and ruler, from 6 to 7.

In summary then, the main changes between the 1975 list of nouns and the 1989 revision are as follows:

(i) 184 dated words were removed from the 1975 list.
(ii) 227 new words were listed.
(iii) 900 or 49 per cent of the words retained from the 1975 list have been placed at a different level.

II Procedure

After several approaches had been tried and validated, the following procedure was adopted as the easiest and most accurate method of assessing the difficulty level of a story or article.

1. Select from the story or selection to be rated, three* passages long enough to contain *at least 25 different nouns in each*. If the style varies with difficulty, it is advisable to choose the more complex passages, since these usually set the upper limit on comprehension. Otherwise, select passages at random from throughout the story. If a textbook is being rated, and students would be expected to learn new vocabulary and content in sequential fashion, then passages drawn from the first three chapters would provide better estimates than those from the latter half of the book.

2. *Identify each noun in the passages to be rated*, and using the list of nouns in the Appendix, look up and record the frequency level of each noun. Any noun *not* appearing in this list of 2,050 is rated Level 9.

e.g., ball (1), balloon (6), ballot (9).

Note:

(a) If a noun occurs more than once in a passage, count it only once.

(b) Do not count people's names.

(c) All other proper nouns (days, ethnic groups, countries, cities, institutions, etc.,) follow the same rules as all common nouns.
e.g., Monday (2), Maori (2), Canada (5), Wellington (9), Beehive (9).

(d) Give regular plural nouns the same rating as their singular form.
e.g., bottle(s) (4).

(e) Hyphenated words follow the normal rules.
e.g., word (2), word-processor (6), word-bank (9).

(f) Any doubtful words are best omitted from the analysis.
e.g., gerunds, abbreviations, acronyms, and recently-coined words.

3. *Calculate the mean frequency level*, i.e., add up the frequency level numbers and divide by the number of nouns.

4. *Refer to table 2 (page 14)* to determine the approximate age group for which the material is suitable for instructional purposes.

*Some research on the reliability of other readability formulae suggests that four or five passages will provide a more accurate indication when whole books are to be rated. If the first three passages provide similar estimates, then such a precaution would be unnecessary.

Worked Example

Selection from New Zealand School Journal (Part 3, Number 3 1986).

THE LIMPET MYSTERY

When you were a small limpet, you found this rock. Between tides, you were always in this exact spot. I watched you grow to fit the bumps and hollows till there were no gaps between your shell and the rock. I think if there were gaps, you would dry out and die. This rock you are on is not very hard. Your shell has worn an oval groove in it.

When the tide is in, you are like a sheep slowly chewing your way around the rock, grazing on algae and tiny seaweeds. The fastest you move is about one centimetre a minute. I have measured and timed you.

When the tide starts going out, you turn and race for home (limpet racing, that is) at nearly three centimetres a minute. Before the rock dries out, you must be back in your oval groove. If you don't make it, you may not be able to seal yourself to the rock. You might dry out and die. You always make it.

How do you find your way back if you have no eyes to see the way? I thought maybe you were following your scent back. I scrubbed your trail with a scrubbing brush. You still got back.

I put bricks in your path. You went around them. You went over them. I put a cage over your home. After two days, you seemed to forget. You stopped trying to get back. I took away the cage and lifted you back to your place.

limpet	9	groove	9	eyes	1
rock	3	sheep	2	scent	9
tides	7	way	1	trail	5
spot	4	algae	9	brush	3
bumps	5	seaweeds	8	bricks	5
hollows	9	centimetre	4	path	5
gaps	6	minute	2	cage	3
shell	5	home	1	days	1
		racing	5	place	1
				TOTAL:	122

Average frequency level of nouns = 122/26 = 4.69.
This passage would be classified as suitable for average 9½–10½ year old readers.

Table 2:
Suitable Age Levels for Readability Ratings Obtained from Noun Counts

Mean Noun Frequency Rating	Approximate Age Range
Below 2.8	7 to 8 years
2.8 to 3.2	7½ to 8½ years
3.2 to 3.6	8 to 9 years
3.6 to 4.0	8½ to 9½ years
4.0 to 4.4	9 to 10 years
4.4 to 4.8	9½ to 10½ years
4.8 to 5.2	10 to 12 years
5.2 to 5.6	11 to 13 years
5.6 to 6.0	12 to 14 years
6.0 to 6.4	13 to 16 years
Over 6.4	15 years and over

This table was prepared by testing individually, 100 children with the graded passages of the *Progressive Achievement Tests of Reading Comprehension*. Pupils who answered at least three out of five questions correctly on each passage, moved on to the next passage until they reached their limit. These limits were plotted against the pupils' ages, and trend lines were drawn to produce the table.

III Evaluation of the Method

Numerous studies have been conducted to establish the validity of the noun frequency method. In five independent but similar investigations, a number of prose passages were chosen at random from newspapers, books, magazines, school texts and reading tests. The passages ranged in difficulty from simple material suitable for average 7 or 8 year olds, to complex prose likely to provide some challenge for competent adolescent readers. Each selection contained from 120 to 150 words. In the first two investigations eight passages were used; in the other three, the number of passages was increased to 12, 14 and 16 respectively. The number of 'judges' used in the five investigations was 10, 12, 43, 50 and 43 respectively.

Teachers were asked to 'rank the passages in order of difficulty of comprehension, from easiest to hardest'. The average ranks of the teachers provided the criterion of difficulty in the first two investigations. In the last three, the teachers' rankings were supplemented with the averaged rankings of

top-stream 12 to 15 year old pupils. As the opinions of the teachers and the pupils correlated over 0.90 in these studies, their rankings were subsequently combined.

Teachers' and pupils' opinions were used as a criterion measure because they provided a more direct and sensitive measure than the usual method of graded texts or results from reading comprehension tests. Studies conducted by Klare (1974) and Harrison (1980) have confirmed that pooled teacher judgements are an excellent criterion for judging the validity of various readability estimates. Furthermore, the combined-opinion criterion is less cumbersome than the 'cloze' test method proposed by Bormuth (1966). The latter method was used, however, in a later validity study, reported below.

Table 3:
Rank Correlations Between Judges' Criterion of Difficulty and Readability Estimates for Five Independent Studies

Readability Estimate	Series 1	Series 2	Series 3	Series 4	Series 5	Median
Noun Frequency Level	.95	.91	.85	.90	.88	.90
Noun plus Adjective Frequency Level	.90	.89	.82	.86	.92	.89
Noun plus Verb Frequency Level	.97	.88	.64	.82	.89	.88
Lorge Formula	.87	.93	.80	.69	.92	.87
Syllables per 100 Words	.96	.92	.76	.74	.85	.85
Dale-Chall Formula	.78	.93	.68	.85	.92	.85
Proportion of Abstract Nouns	.70	.88	.82	.83	.79	.82
Proportion of Unfamiliar Words	.80	.81	.71	.83	.82	.81
Verb Frequency Level	.72	.83	.07	.49	.83	.72
Adjective Frequency Level	.64	.67	.48	.63	.89	.64
Sentence Length	.76	.98	.54	−.04	.45	.54
Ratio of Prepositional Phrases	.83	.43	.10	.14	.41	.41

The correlations of the best predictors of readability, as found in the five investigations, are listed in Table 3. The fact that all these correlations are slightly higher than those reported in previous studies is attributable largely to the greater range of difficulty in the passages used. In the third series, this

spread of difficulty was reduced, with a corresponding drop in validity coefficients. From Table 3, it can be seen that the correlations for the noun frequency are consistently higher on average than any of the other measures examined. Moreover, the noun frequency method contributes substantially to the predictive value of the adjective and verb frequency counts, with which it was combined for experimental purposes.

The Lorge and Dale-Chall formulas, which require the combining and weighting of such variables as sentence length, prepositional phrases, and unfamiliar words, are not only less effective in these studies, but are considerably more laborious in their calculation. Yet in a large-scale survey in the United Kingdom, Harrison (1980) showed that the Dale-Chall formula was the best of several indicators of readability, as measured against the pooled judgements of teachers.

The Fry formula, which is based on the number of syllables per 100 words and sentence length, is not readily comparable with the other estimates since it provides a location on a two-axis graph, rather than a single numerical score. Its dependence on a structural dimension, sentence length, appears to make it somewhat less valid, as were all such methods examined.

Among the single dimension measures studied, the best were all indirect estimates of vocabulary load, but were less refined and less useful as predictors of difficulty level than was the average noun frequency level.

These vocabulary variables are all highly intercorrelated and were not found to increase their correlations with the criterion when combined in various ways. Nor was it found profitable to combine the noun frequency count with any of the structural variables. In the third series, for instance, a combination of noun frequency level plus number of words per sentence, produced a validity coefficient of 0.68, or 0.17 less than the noun count alone. Where discrepancies did occur between the vocabulary load predictors and the criterion, they seemed to be attributable more to some unique feature of the author's style, or to a specialised use of vocabulary. For instance, the correlations for the noun counts in the third study were lowered mainly by three passages: a technical description of door-hanging; a biographical passage which was heavily packed with detail; and a narrative passage from Tolstoy whose style was considered unusual by the judges, although the vocabulary was simple. *It is doubtful whether any objective index could predict these intangible qualities without becoming more cumbersome than the determination of the criterion itself.*

Another early validity check was made using the 'cloze' test criterion as recommended by Bormuth (1966). The prose passages used in this study were selected and rated by Bormuth himself, in the following manner. They were administered in 'rotating cloze test format' to carefully chosen, representative samples of American school children. In this procedure, each fifth word was omitted from the passage. The student's task was to fill the gap with the appropriate word, on the basis of his/her understanding of the con-

text. Five parallel forms of each passage were used, thus allowing each word to be tested once. The 'cloze index' for each selection was taken as the average percentage of words that were correctly inserted by the five groups of pupils tested. This index is still considered by many researchers to be the most satisfactory criterion of reading difficulty, despite the cumbersome nature of its production.

Every passage consisted of 100 words, which normally generated about 20 nouns in each. This is less than the optimum number of the noun count procedure, but it did produce a useful guide. Passages having fewer than 18 nouns were omitted from consideration. Highly technical selections were also excluded.

The 63 passages were classified according to topic, and noun count ratings were made. These ratings were then correlated with the 'cloze' ratings, as provided by Bormuth. The results are presented in Table 4.

The results for these passages again show consistently high validity. Furthermore, the omission of one unusual passage from the Current News series would have increased the correlation coefficient from 0.82 to 0.88.

It is of interest to note that, of over 70 readability indices which Bormuth investigated in his 1966 article, the highest correlations with 'cloze' difficulty were produced by such measures as number of letters per independent clause (0.81) and several measures of vocabulary load (between 0.70 and 0.80). Bormuth's investigations included more passages, however, many of which were judged 'a priori' to be too short or too technical for the noun count procedure.

Table 4:
Correlations Between Noun Count Ratings and Cloze Test Difficulty on Selected Passages

Subject	Number of Passages	Rating
Literature	16	0.89
Biology	17	0.90
Current News	18	0.82
Geography	12	0.92

Other Word Frequency Lists

In each of the five earlier validity studies reported in Table 3, the *NZCER Alphabetical Spelling List*, Arvidson (1960), was used as the base source for checking the frequency level of nouns in the passages. In the fifth of these studies other available word counts were also investigated. Examined first

were the lists prepared by Radford (1960), Edwards and Gibbon (1964), and the Board of Education of the City of New York (1954). These lists were prepared on the basis of the written work of Australian, English and American children, respectively. Wright's (1965) list which is based on the frequency of words in common reading materials was also used. The correlations for noun frequency counts, graded according to these lists, were all slightly lower than those produced with the NZCER list, but were sufficiently high to suggest that they could be used with profit in the countries for which they were intended.

Radford's (1960) list contains nearly 3,000 words, but uses only six levels of frequency. Its predictive validity of 0.84 in this study compared reasonably well with the 0.88 of Arvidson (1960). The Edwards and Gibbon (1964) list contains only 1,347 words, classified (at the seven years over level) into six degrees of frequency. Nevertheless, when nouns were graded by this list, a correlation coefficient of 0.80 with the criterion was obtained. With a more extensive list the validity would doubtless improve.

The Spelling List of the Board of Education of the City of New York contains 5,000 words classified into ten frequency levels and is, therefore, very useful for a sensitive vocabulary count. Its validity coefficient of 0.87 would probably be even higher if used in an American context, since it was affected in this study by the occurrence of a number of words in the passages unfamiliar to New Zealanders, but not to Americans.

Wright's (1965) word count, based as it was on predominantly adult reading matter, rather than children's writing, correlated 0.71 with the criterion. This result was obtained using the first five levels only (i.e., the most common 5,000 words). Nevertheless, the discrepancies which lowered the correlation would not, in the opinion of the writers, be reduced by any adaptation of this or parallel lists.

Comprehension appears to depend more on familiarity of words used by pupils in their own writing, rather than of words they encounter in their reading. Hence our reliance on data from Croft's (1983a) national survey of primary writing, to update the list of nouns contained in the Appendix.

Recent Validity Studies

A further study conducted by Elley (1982) made use of a different criterion of readability – the average difficulty indices of comprehension questions based on reading passages in standardised tests. This criterion was widely used in early research on readability but has the obvious disadvantage that the questions can vary in difficulty according to the approach of the test constructor. Nevertheless, as all the tests were standardised, they had been item analysed and revised, and would presumably have been screened for extreme cases of fluctuation in difficulty.

Table 5:
Correlations between Noun Count Ratings and Passage Mean Difficulty Indices of Items in Standardised Reading Tests

Test	No. of Passages	Noun Frequency	Noun + Verb Frequency	% Words on Dale List	Syllables per 100 words	Sentence Length
NSW Rdg. A	6	.84	.75	.82	.75	.38
NSW Rdg. B	6	.75	.80	.80	.79	−.32
PAT Rdg. A (Pt 3)	9	.81	.67	.62	.41	.25
PAT Rdg. B (Pt 8)	9	.88	.88	.60	.42	.52
Stanford Rdg. A	6	.84	.72	.82	.15	.30
Median		.84	.75	.80	.42	.30

Table 5 shows the results for five such tests which have passages of 20+ nouns and for which accurate difficulty indices could be obtained. Although the correlations are lower for the reasons stated above, the trends are the same as in earlier validity studies. The Noun Frequency Method, on its own, is consistently more valid than the other procedures.

In order to explore further the reasons for the success of this apparently sensitive measure of vocabulary load, Elley (1982) also compared the effects on pupil comprehension of simplification of difficult prose passages using three different approaches: viz, reducing sentence complexity, reducing vocabulary load, and reducing both simultaneously. Four difficult prose passages of 150–200 words were selected from textbooks and encyclopaedias and rewritten. These passages were presented as lexical cloze tests (with content words only deleted in the ratio of 1 word in 6±1). The sample of students was 48 14–15 year olds drawn from two Christchurch urban secondary schools. The content of the passages covered history, science, literature and biography.

The passages were revised to provide three alternative forms of the original.

(i) The *simplified syntactic* (SS) revision eliminated complex sentences, passives, subordinate clauses and circumlocutions, with minimal changes in meaning. The mean sentence length was reduced from 32.4 words (advanced adult level) to 11.3 words (10 year old level).

(ii) The *simplified vocabulary load* (SV) revision retained the long complex sentences but replaced unfamiliar words with familiar ones. The mean noun frequency count was reduced accordingly from 6.96 (advanced adult) to 4.62 (10 year old level).

(iii) The *simplified syntax and vocabulary load* (SSV) revision changed both dimensions simultaneously, while again preserving the intended meaning of the authors, and producing combined effects on sentence length and vocabulary load comparable to the other two separate revisions.

Three weeks after the original cloze tests, the same students took a random sample of two of the 16 possible revised forms of each test (4 topics x 4 modes), again as a lexical cloze test. Students were required to replace content words, which were also deleted in the ratio of 1 in 6 ± 1. All 16 passages were read by at least 6 students, in varying sequences to counteract practice effects.

Residual gain scores were calculated, from pre-test to post-test, and a three-way analysis of variance performed to test the effects of syntax, vocabulary load and reading ability on comprehension gain. As predicted, mean gains for students who read the original versions and simplified syntax (SS) versions were small, while those who read the simplified vocabulary revision (SV) and the combined revision (SSV) were nearly double those of the original passages, with or without syntactic changes. The ANOVA results (Table 6) showed highly significant effects for vocabulary ($F = 16.74$, $p < .001$), but no significant effects for syntax or ability level ($F = 1.44$ and 0.02 respectively). The only interaction effect to reach significance was that of vocabulary and ability level ($F = 8.61$, $p < .001$), which appears to indicate that weaker readers were more confused by the difficult vocabulary than were the more able readers.

Table 6:
Analysis of Variance Showing Effects of Prose Simplification on Gains in Student Comprehension

Source	S. Squares	df	Mean Square	F
A (Ability)	0.10	1	0.10	0.02
B (Syntax)	8.76	1	8.76	1.44
C (Vocabulary)	102.10	1	102.10	16.74**
AB	3.01	1	3.01	0.49
AC	52.50	1	52.50	8.61**
BC	6.51	1	6.51	1.07
ABC	3.01	1	3.01	0.49
Within Cells	536.92	88	6.10	–
Total	712.91	95	–	–

**p<.001

A plausible interpretation of these results is that the main difficulty students have in comprehending complex prose lies with the vocabulary load, rather than the sentence structure. Hence, a sensitive index of vocabulary load is required in order to assess the difficulty of prose passages intended to be read with understanding. Certainly, this study was confined to high school students, but it produced similar effects across all topics, expository or narrative. Complex syntax may of course present problems for very young children, but it is of little consequence for most high school students.

It is worth noting that critics of objective readability measures have pointed to empirical studies such as those of Davison and Kantor (1982) which show no effects of *syntax* simplification, and use such findings to denigrate the formulae. The Christchurch study reported above is consistent with such studies with respect to syntax, but suggests that the potential value of vocabulary load is not affected by these conclusions.

Why then, have measures of syntax been used repeatedly in most readability formulae? Possibly because authors have a natural tendency to match vocabulary load with sentence complexity. When they write for children they reduce both simultaneously. Hence, correlational studies would show a relatively high relationship between both variables. It takes an experimental study to show whether both are critical for their effects on reading comprehension.

Other researchers, e.g., Mason (1986), have criticised the naivety of current readability measures because they ignore indices of abstraction based on such linguistic features as the level of nominalisation of nouns, the frequency of words of Latin and Greek origin, and of verbs in the passive tense.

However, an analysis of the graded noun list in the Appendix shows that the Noun Frequency Method is already an accurate indicator of abstraction, presumably because they are highly correlated with frequency of use by children of varying age levels. Thus, the nouns found at Level 1 are concrete (baby, back, ball, bat, bath...) while most of those found above Level 7 tend to be abstract (advantage, advertisement, affair, association, attempt...).

Other critics downplay the role of objective validity measures on the grounds that they do not identify the causes of difficulty in prose, and can therefore be misleading for those who simplify text for children. The Noun Frequency Method does not claim to be any more than an indicator of difficulty, based on statistical relationships. But why does it appear to be so sensitive? A number of psycholinguistic studies, e.g., Loosen (1981), Wearing (1974), Thios (1975), Clark and Card (1969), have shown that the content words in a text do carry the load of meaning, and that nouns are more important in this regard than verbs, adjectives or function words. In Loosen (1981) for instance, nouns were rated for importance and were recalled better than verbs, adjectives, adverbs or function words. Intuitively it makes sense that the subject and object of a sentence, usually nouns, must be understood if the text is to be processed. The bulk of the studies quoted above and evi-

dence from cloze tests, miscue analysis, recall tests, ratings of importance and cues for recall all point in this direction. Hence, the efficiency and value of an indicator based on noun familiarity is not very surprising.

There is clearly a need for more research to refine existing indices of vocabulary load, but there is sufficient evidence to show the value of the current procedure and justify its continued use by teachers, researchers, librarians, editors and others, as a practical method of assessing the readability of text.

Computer Applications

The increased availabilty of personal computers has made a computerised version of the Noun Frequency Method a viable alternative. Earlier versions in BASIC had been written for Apple machines and Commodore 64's. These have proved valuable for local use, and although developed with the publisher's permission and assistance, were nevertheless subsidiary to the manual method.

Ian Livingstone has developed programs for Apple,Commodore,BBC and IBM compatible machines, as part of this current revision. These will provide an alternative method of calculating readability levels and will pave the way for individuals to build up their handy files of material graded by readability level.

These programs will accept nouns in isolation from the remainder of the text provided they are entered individually. In this instance there is no need to 'flag' the nouns. Alternatively, running text may be entered from a word-processor, but if this option is used, each noun to be rated must be identified before the program will run. These two methods of entering nouns provide a measure of flexibility for users.

The print out coming from these programs will show the title of the extract, the readability estimate and the nouns entered or 'flagged', along with their frequency levels. This latter feature will be of benefit when there is a requirement to rewrite text to a specified readability level, as the nouns which need to be replaced will be easily identified. The added flexibility introduced by the programs bring a new dimension to the Noun Frequency Method, which we are sure will be fully utilized by increasing numbers of users.

IV Conclusions and Cautions

Assessing readability is a complex matter. The method described in this text, although simple to apply, is not a panacea. It should be seen as an aid, to be used sensitively and cautiously, and supplemented by a knowledge of children's reading interests, and of any idiosyncracies in the style of the reading material which may not be reflected in an objective measure of vocabulary load. Unconventional sentence structure, high density of ideas, uncommon technical terms, frequent use of idioms, metaphoric language, and simple words used in unusual ways, all could distort the estimates of readability obtained in a few cases. An unevenness in difficulty of vocabulary load on the part of the author would also complicate assessment, no matter how it was carried out. In addition, the method should not be used with:

(i) poetry
(ii) beginning reading material
(iii) technical articles
(iv) material having a specialised vocabulary.

It is most appropriate for children's prose, designed for 7 to 16 year old readers. For textbooks with specialised vocabulary, the 'cloze' procedure, although somewhat less convenient, has much more to recommend it.

Despite these cautions and limitations, there appears to be a proper and useful role for readability indices. Many teachers have found it helpful in selecting books and articles for children. A classified guide to School Journal stories has been prepared by the Resources Division of the Ministry of Education with the aid of the Noun Frequency Method.

In conclusion, it must be emphasised that books do vary tremendously in their ease of comprehension. Children likewise vary in their ability to comprehend. To match a child with a suitable book is an important task which requires undoubted professional skill. Wise adults will know when and how to use an objective index to assist them in this task. It is to help in such an enterprise that the Noun Frequency Method of assessing readability was developed and published.

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Appendix

Revised List of Nouns Graded by Frequency of Use

A

accident 5
account 6
ache 8
act 6
action 8
activity 6
addition 6
address 5
adult 8
advantage 8
adventure 5
advertisement 8
advice 8
aeroplane 2
affair 7
afternoon 2
age 3
agreement 7
agriculture 8
aid 5
aim 6
air 2
airline 6
airport 4
alarm 5
alley 8
alligator 4
alphabet 6
ambulance 7
America 3
American 4
amount 5
amusement 8
anchor 8
angel 6
angle 8
animal 3
ankle 7
answer 3
ant 6
anybody 4
anyone 3
anything 2
apartment 7
ape 7
appearance 8
apple 1
appreciation 8
apricot 7
April 4
apron 8
area 6
argument 8
arm 3
army 3
arrow 5
art 4
artist 7
assembly 5
assignment 8
association 7
astronaut 7
atom 6
attack 6
attempt 8
attention 6
attic 8
audience 6
auditorium 8
August 4
aunt 2
auntie 2
aunty 2
Australia 4
Australian 5
author 6
autumn 4
avalanche 5
avenue 6
average 7
axe 7

B

baby 1
back 1
backstop 8
bacon 8
bacteria 7
badge 6
bag 3
bait 5
baker 8
baking 3
balance 8
ball 1
ballet 7
balloon 6
banana 4
band 3
bandage 7
bang 2
bank 3
banner 8
bar 5
barbecue 5
bark 5
barn 4
barrel 7
barrier 7
base 3
baseball 4
basement 7
basin 7
basket 3
basketball 5
bat 1
bath 1
bathroom 7
battery 7
battle 5
bay 4
beach 1
bead 6
beak 5
beam 5
bean 6
bear 2
beard 6
beast 3
beauty 6
bed 1
bedroom 3
bedtime 8
bee 4
beef 7
beer 7
beggar 8

beginning 3
behaviour 7
being 2
bell 3
belt 5
bench 6
bend 6
berry 5
bet 4
Bible 7
bicycle 4
bike 1
bill 4
bin 4
bird 1
birth 6
birthday 2
biscuit 4
bit 3
bite 4
blackberry 8
blackboard 6
blade 8
blanket 5
blast 5
blind 6
block 4
blood 3
bloom 7
blossom 7
blow 4
board 3
boat 1
body 2
bomb 6
bone 4
bonfire 8
bonnet 8
book 1
booklet 8
boom 6
boot 5
border 8
bore 8
boss 5
bother 7
bottle 4
bottom 3
bounce 8
bound 8
boundary 8
bow 5
bowl 4
box 2
boy 1
boyfriend 7
bracelet 8
brain 7
brake 7
branch 4
brand 8
brass 8
brat 7
bread 2
break 3
breakfast 3
breast 6
breath 5
breeze 8
brick 5
bridge 3
bridle 8
Britain 5
broadcast 8
brook 7
broom 7
brother 1
brownie 8
bruise 7
brush 3
bubble 6
bubblegum 6
bucket 5
bud 8
bug 7
buggy 4
building 3
bull 5
bulldozer 6
bullet 7
bump 5
bunch 6
bundle 8
bunk 6
bunny 2
bus 1
bush 3
business 4
butcher 8
butter 3
butterfly 6
button 5

C

cab 7
cabbage 5
cabin 4
cabinet 8
cafeteria 8
cage 3
cake 2
calendar 6
calf 4
call 2
camel 6
camera 7
camp 2
campaign 7
can 1
Canada 5
canary 6
cancer 4
candle 5
candy 5
cane 6
cannibal 8
canoe 5
canyon 6
cap 6
capital 5
captain 3
car 1
caravan 6
carbon 8
card 3
cardboard 7
cardigan 8
care 2
caretaker 7
carol 7
carpenter 6
carpet 6
carriage 6
carrot 7
cart 7
case 4
cash 8
cassette 8
castle 4
cat 1
catch 2
catcher 6
cattle 4
cause 4
cave 3
ceiling 7
celery 8
cell 8
cellar 7
cement 8
cent 2
centimetre 4
centre 4
century 6
cereal 8
certificate 8
chain 7
chair 3
chairlift 7
chalk 6
champion 6
championship 4
chance 4
change 4
chapter 7

character 7
charge 6
charm 8
chart 6
chase 5
check 6
cheek 8
cheer 7
cheese 4
chemist 8
cheque 8
cherry 7
chest 5
chick 7
chicken 3
chief 4
child 1
children 1
chimney 5
chin 8
China 5
Chinese 5
chip 3
chocolate 5
choir 8
chorus 8
Christmas 2
church 2
cigarette 8
circle 5
circus 3
citizen 5
city 2
class 1
classroom 3
claw 5
clay 5
clerk 6
cliff 6
climate 7
cloak 7
clock 4
closing 6
cloth 6
clothes 2
clothing 5
cloud 5
clown 4
club 3
clump 6
coach 7
coal 4
coast 5
coat 2
cobweb 5
cocoa 8
coconut 7
coffee 4
coffin 7
coke 7
cold 1
collar 6
collection 7
college 7
colour 2
colt 8
comb 5
comic 6
command 8
commercial 8
committee 7
community 7
company 6
compass 6
competition 8
composition 8
computer 3
concert 6
concrete 6
condition 8
conductor 8
cone 8
container 7
contest 5
continent 8
control 5
cook 2
Cook Islander 6
copper 7
copy 7
corn 6
corner 2
cost 3
costume 6
cot 3
cottage 5
cotton 3
couch 6
cough 7
council 8
counter 7
country 2
couple 4
courage 7
course 3
court 4
cousin 2
cover 3
cow 2
cowboy 5
crab 7
crack 6
cracker 4
craft 6
crane 3
crash 3
crayfish 8
crayon 7
cream 4
creature 7
creek 4
crew 5
cricket 3
crime 7
criminal 7
crocodile 3
crop 7
cross 3
crossing 8
crow 8
crowd 5
crown 5
crumb 7
crust 7
cry 1
cub 2
cup 7
cupboard 6
cure 8
curl 6
curtain 5
cushion 7
custom 7
customer 8
cut 2
cutting 5

D

dad 1
daddy 1
dairy 5
daisy 6
dam 7
damage 6
dame 6
dance 3
dancing 6
danger 5
dark 7
darkness 6
darling 7
dart 7
dash 8
date 3
daughter 4
dawn 8
day 1
deal 7
dear 2
death 6
December 4
decimal 7
decision 8
deck 5
decoration 8

deed 8
deer 3
degree 8
den 7
dentist 5
department 6
description 8
desert 3
design 7
desk 3
dessert 7
destination 7
development 8
devil 6
diagram 8
diamond 7
diary 8
dictionary 5
difference 7
difficulty 7
dinner 2
dinosaur 8
dip 5
direction 6
dirt 5
disaster 7
disc 7
disco 6
discovery 7
disease 5
dish 2
display 3
distance 4
district 7
ditch 6
dive 6
diver 6
division 7
dock 7
doctor 3
dog 1
doll 2
dollar 2
dolly 2
dolphin 6
donkey 6
door 1
dot 6
doubt 8
doughnut 6
dozen 7
dragon 7
drain 8
drawer 7
drawing 5
dream 5
dress 2
dresser 8
dressing 8
drill 7
drink 2
drive 3
driver 5
driveway 8
drop 4
drug 7
drum 5
duck 3
dummy 5
dump 6
dust 4
duty 7
dwarf 7

E

eagle 7
ear 3
earth 3
earthquake 6
east 3
Easter 4
edge 7
editor 5
education 5
eel 5
effect 8
effort 8
egg 2
election 8
electricity 6
elephant 3
elevator 7
encyclopaedia 8
end 1
ending 8
enemy 6
energy 7
engine 4
England 4
English 5
entertainment 7
entrance 8
envelope 7
equipment 6
escape 5
eve 7
evening 3
event 6
everybody 3
everyone 3
everything 2
examination 6
example 7
exchange 8
excitement 8
excuse 5
exercise 6
exhibition 8
expedition 8
experience 5
experiment 7
explosion 8
expression 8
eye 1

F

face 1
fact 6
factory 6
fair 3
fairy 4
faith 8
fall 2
family 2
fan 7
farm 1
farmer 6
farming 6
fashion 8
fat 2
father 1
fault 8
favour 7
fawn 6
fax 8
fear 6
feast 5
feather 7
February 4
feeling 4
feet 2
fellow 7
female 6
fence 3
fern 7
ferry 8
fever 7
field 3
fight 2
figure 7
file 8
filling 7
film 4
fine 4
finger 4
finish 4
fir 8
fire 2
fire brigade 8
fire engine 8
fireman 7
fireplace 8
fireworks 6
first 2

fish 1
fisherman 6
fist 8
fit 5
fix 3
flag 3
flake 8
flame 7
flare 8
flash 5
flat 4
flavour 8
flesh 8
flight 6
flock 8
flood 4
floor 2
flour 7
flow 7
flower 2
flute 6
fly 2
foal 6
fog 8
fold 6
folk 7
food 1
fool 6
foot 2
football 3
footpath 6
footsteps 6
force 6
forehead 8
forest 3
fork 3
form 4
formula 7
fortune 4
fountain 7
fox 4
fraction 8
frame 7
freckle 8
freedom 6
freezer 5
Friday 2
friend 1
friendship 8
fridge 5
fright 6
frog 4
front 2
frost 6
fruit 3
fuel 6
fun 1
funeral 8
fur 4
furnace 8
furniture 6
fuss 5

G

gain 7
gala 6
gale 7
gap 6
garage 6
garbage 8
garden 3
gas 4
gate 3
gathering 8
gear 3
general 6
gentleman 8
geography 7
germ 6
ghost 2
giant 2
gift 7
gingerbread 7
giraffe 6
girl 1
girlfriend 7
glass 3
globe 8
glove 4
glue 8
goal 4
goat 5
goblin 6
God 2
godmother 7
gold 2
goldfish 7
golf 7
good 1
goodbye 4
goodness 7
goose 7
government 6
gown 8
grade 4
grain 7
gram 7
grammar 8
grandad 3
grandfather 3
grandma 3
grandmother 3
grandpa 4
granny 3
grape 6
grass 2
grasshopper 8
grave 6
graveyard 8
grease 8
green 1
grey 3
grill 5
grin 6
grocer 3
groceries 8
ground 2
group 3
growl 5
growth 6
guard 5
guess 3
guest 7
guide 6
guitar 7
gum 7
gun 2
guy 5
gym 7

H

habit 7
hail 7
hair 2
haka 7
half 2
hall 3
halloween 7
ham 7
hamburger 4
hammer 6
hand 2
handkerchief 5
handle 6
hangi 8
happiness 7
harbour 5
harm 6
harness 8
harvest 7
hat 1
hatch 7
hawk 8
hay 2
head 1
headache 8
health 5
heart 4
heat 5
heater 5
heaven 7
hedge 5
hedgehog 8
heel 8

height 7
helicopter 5
help 1
helper 8
hen 3
herd 6
hero 7
highway 8
hike 4
hill 2
history 6
hit 1
hitchhiker 8
hobby 5
hockey 8
hoe 6
hog 7
hold 2
hole 2
holiday 2
home 1
homework 5
honey 5
honour 7
hood 8
hoof 5
hook 5
hoop 6
hop 4
hope 1
horn 5
horror 6
horse 1
hose 6
hospital 3
hotel 4
hour 2
house 1
household 8
hug 5
hui 7
human 6
hundred 2
hunt 3
hunter 6
hurricane 5
hurry 3
husband 5
hut 4

I

ice 2
ice cream 2
iceberg 7
ice block 4
idea 4
illness 6
imagination 8
importance 8
improvement 8
inch 6
increase 8
independence 8
index 7
Indian 5
industry 6
influence 8
information 6
ink 8
inn 8
insect 4
inside 2
instance 7
instrument 7
interest 7
introduction 8
invention 8
invitation 8
iron 3
island 2

J

jacket 6
jail 5
jam 2
janitor 7
January 4
Japanese 5
jar 5
jaw 7
jeans 6
jelly 3
jersey 6
jet 4
jewel 7
jewellery 7
job 3
joke 5
journal 6
journey 5
joy 3
judge 6
jug 4
juice 5
July 4
jump 2
June 4
jungle 5
jungle-gym 7
junior 6
junk 5
justice 8

K

kangaroo 7
keeper 6
kennel 4
kettle 7
key 5
kick 5
kid 3
killer 7
kilogram 4
kilometre 4
kind 2
kindergarten 6
kindness 7
king 2
kingdom 8
kiss 5
kit 5
kitchen 3
kite 6
kitten 2
kiwi 6
knee 6
knife 3
knitting 7
knob 8
knock 3
knot 7
knowledge 7

L

lab 7
labour 6
lace 6
lack 8
lad 7
ladder 5
lady 2
lake 2
lamb 4
lamp 6
land 2
lane 8
language 6
lantern 8
lap 5
laser 7
laugh 3
law 7
lawn 3
lawyer 8
lead 4
leader 4
leaf 2
league 7
leak 8
leap 4
leather 7
left 2

leg 2
legend 7
leisure 8
lemon 7
lemonade 7
length 7
lesson 2
letter 1
letterbox 7
lettuce 7
level 5
liberty 8
library 3
licence 7
lid 7
lie 4
life 2
lift 4
light 2
lightning 6
liking 6
limb 7
lime 6
limit 7
line 2
linen 7
lion 3
lip 4
lipstick 8
liquid 7
list 5
literature 8
litre 4
living 4
lizard 8
load 6
loaf 7
lock 5
log 3
lollipop 8
lolly 2
look 1
lookout 6
loss 8
lot 1
lounge 3
love 1
luck 4
luggage 7
lump 2
lunch 2
lung 7

M

machine 4
machinery 7
magazine 6
magic 2
maid 6
mail 3
majority 8
make 2
male 5
mama 3
man 1
mana 7
manager 5
manner 7
Maori 2
map 2
marae 7
marble 8
March 4
march 5
mark 3
market 4
marriage 8
mask 8
mass 8
master 3
mat 4
match 4
mate 4
material 6
mathematics 5
maths 3
matter 4
May 4
mayor 8
meadow 8
meal 4
meaning 6
means 6
meantime 8
measles 8
meat 2
medal 7
medicine 5
meeting 4
member 7
memory 8
men 1
merry-go-round 8
mess 3
message 6
messenger 8
metal 6
method 6
metre 4
mice 5
microwave 7
middle 2
midnight 6
mile 3
milk 1
milkman 8
million 4
mind 2
mine 3
miner 7
mineral 8
minister 7
minute 2
mirror 6
mischief 7
miss 3
missile 8
mission 7
mistake 6
mitten 8
mixture 8
model 5
moment 3
Monday 2
money 2
monkey 3
monster 3
month 3
mood 7
moon 2
moonlight 8
mop 8
morning 1
moss 6
motel 6
moth 8
mother 1
motion 8
motive 6
motor 5
motorbike 8
mountain 2
mouse 3
mouth 3
move 5
movement 8
movie 5
mower 5
mud 3
mum 1
mummy 1
murder 8
muscle 8
museum 4
music 2
mutton 8
mystery 6

N

nail 5
name 1
nap 7
nation 6
native 8

nature 7
navy 6
neck 3
necklace 8
need 3
needle 7
neighbour 5
neighbourhood 8
nest 3
net 4
netball 5
New Year 6
New Zealand 2
New Zealander 4
news 4
newspaper 4
nickname 8
night 1
nightmare 8
Niuean 6
no-one 7
nobody 5
noise 3
noon 5
north 3
nose 3
note 3
notebook 7
nothing 2
notice 5
November 4
nuisance 8
number 3
nurse 3
nut 5
nylon 6

O

oak 6
oar 8
oasis 6
object 5
occasion 7
occupation 8
ocean 5
o'clock 3
October 4
offer 7
office 3
officer 6
oil 3
one 1
onion 8
opening 5
opera 8
operation 8
opinion 8
opportunity 8
orange 6
orchard 7
orchestra 7
order 4
organ 7
organisation 8
ornament 7
other 1
outfit 6
outlaw 8
outline 8
oven 5
overalls 8
owl 6
owner 6
oxygen 6
oyster 8

P

pa 6
pack 5
package 6
packet 5
pad 5
paddle 6
paddock 4
page 5
pain 6
paint 3
painter 8
painting 4
pair 4
pakeha 7
palace 6
palm 8
pan 6
pantry 8
pants 4
paper 2
parachute 8
parade 5
paragraph 7
parcel 4
pardon 7
parent 3
park 2
parrot 8
part 2
partner 7
party 2
pass 3
passage 7
passenger 7
past 2
paste 7
pat 6
patch 6
path 5
patient 8
pavement 8
paw 4
pay 3
payment 8
pea 7
peace 7
peach 6
peak 7
peanut 8
pear 7
peck 7
peg 7
pelican 4
pen 3
pencil 4
penguin 6
people 1
pepper 8
perfume 8
period 5
permission 8
person 3
pet 2
petal 8
petrol 5
phone 3
photo 7
photograph 7
phrase 8
piano 6
pick 3
picnic 3
picture 2
pie 4
piece 2
pig 3
pigeon 8
pile 5
pill 7
pillow 6
pilot 6
pin 5
pine 5
pioneer 6
pipe 5
pirate 5
pit 6
pitch 7
pitcher 5
place 1
plain 6
plan 3
plane 3
planet 4
plant 3
plastic 6
plate 5

platform 8
play 1
player 6
playground 4
playroom 7
playtime 5
pleasure 7
plum 8
pocket 4
poem 5
poet 8
poetry 8
point 4
poison 6
polar bear 8
pole 4
police 4
policeman 4
pond 5
pony 3
pool 3
pop 4
popcorn 5
population 7
porch 5
pork 6
porridge 6
port 4
position 8
post 4
post office 5
poster 7
postman 3
pot 5
potato 5
pottery 7
pound 7
powder 5
power 3
practice 4
prayer 8
present 2
president 6
pressure 8
price 2
prince 4
princess 4
principal 7
principle 8
print 6
printing 7
prison 7
prisoner 7
prize 4
problem 6
process 7
product 7
production 7
professor 7
program 4
programme 4
progress 8
project 6
promise 7
property 7
protection 8
public 7
pudding 8
puddle 8
puff 8
pullover 8
pump 6
pumpkin 5
punishment 8
pup 3
pupil 6
puppet 8
puppy 3
purpose 7
purse 4
push 4
puss 2
pussy 3
puzzle 7
pyjamas 7

Q

quack 5
quality 8
quantity 8
quarrel 8
quarter 3
queen 3
question 5

R

rabbit 2
race 3
racing 5
racket 6
radar 8
radio 3
raffle 6
raft 6
rag 6
rail 8
railway 8
rain 1
rainbow 7
raincoat 7
rainfall 8
raisin 8
rake 7
ramp 8
ranch 7
range 8
ranger 7
rat 3
rattle 8
reach 4
reader 7
reason 4
rebel 6
recipe 8
record 6
recreation 8
reef 4
referee 6
refreshment 8
refrigerator 7
region 7
reindeer 7
relation 8
relative 7
relief 8
religion 8
rent 7
reply 4
report 6
reptile 5
request 8
rescue 6
rest 2
restaurant 7
result 7
return 5
reward 5
rhyme 8
rib 8
ribbon 6
ride 2
rider 8
rifle 6
right 1
ring 3
rise 6
river 2
road 1
roar 5
roast 7
robber 5
robot 7
rock 3
rocket 4
rod 4
roll 4
roller 6
roof 3
room 1
rooster 7
root 6

rope 3
rose 5
round 3
route 7
row 5
rubber 5
rubbish 6
rug 6
rugby 4
rule 6
ruler 7
run 1
runner 7
rush 6

S

sack 4
saddle 6
safe 4
safety 5
sail 4
sailor 7
salad 8
salary 8
sale 6
salesman 8
salmon 8
salt 4
sample 8
Samoan 6
sand 3
sandwich 6
Saturday 2
sauce 6
saucepan 8
saucer 5
sausage 6
saving 6
saw 1
saying 3
scale 7
scar 8
scarf 8
scene 6
scenery 8
school 1
schoolhouse 7
schoolmate 7
schoolroom 7
science 5
scientist 6
scissors 6
scooter 7
score 6
scout 6
scrap 8
scratch 7
scream 6
screen 7
sea 1
seagull 8
seal 5
seam 8
search 5
seashore 8
seaside 5
season 5
seat 3
seaweed 8
second 2
secret 5
secretary 8
section 6
seed 4
seesaw 6
senior 6
sense 7
sentence 6
September 4
series 7
servant 8
service 7
set 2
setting 5
settler 8
shack 8
shade 6
shadow 5
shake 4
shape 5
share 6
shark 6
sharpener 8
shed 2
sheep 2
sheet 5
shelf 6
shell 5
shelter 6
shield 7
shine 6
ship 2
shirt 5
shock 7
shoe 2
shooting 3
shop 1
shopkeeper 8
shopping 5
shore 4
shorts 6
shot 2
shoulder 6
shout 5
shovel 7
show 2
shower 6
shuttle 6
sickness 7
side 2
sight 4
sign 5
signal 7
silence 6
silk 7
silver 5
sink 6
sir 4
sister 1
situation 8
size 4
skate 7
skateboard 3
skating 6
skeleton 7
ski 5
skill 6
skin 3
skirt 6
sky 2
sky rocket 5
slave 6
sled 5
sleep 1
sleeve 8
slice 8
slide 3
slip 5
slippers 4
smell 5
smile 6
smoke 3
snail 7
snake 5
snow 1
snowball 7
snowflake 8
snowman 7
soap 3
soccer 6
society 8
sock 5
soda 7
softball 3
soil 7
soldier 3
solution 8
somebody 3
someone 3
something 1
son 3
song 3
sort 4
sound 3
soup 8

south 3
space 4
spaceship 5
spade 8
spark 8
sparrow 8
speaker 5
spear 7
speech 5
speed 5
spell 6
spelling 3
spider 7
spin 7
spinach 8
spirit 7
splash 6
split 7
spook 4
spoon 5
sport 3
spot 4
spray 8
spring 2
square 4
squash 4
squeeze 8
squid 5
squirrel 5
stable 7
stack 7
stadium 6
stag 6
stage 5
stair 2
stalk 8
stall 7
stallion 6
stamp 4
stand 3
standard 5
star 2
start 2
state 8
statement 7
station 3
stationery 6
statue 8
stay 7
steak 7
steam 7
steel 5
stem 7
step 3
stereo 8
stew 7
stick 2
sting 7
stitch 8
stock 7
stocking 5
stomach 4
stone 3
stool 6
stop 2
store 3
storekeeper 8
storm 3
story 2
stove 2
stranger 7
strap 6
straw 5
strawberry 7
stream 4
street 2
strength 7
strike 6
string 3
strip 8
stripe 6
stroke 8
student 6
study 4
stuff 5
stunt 8
style 8
submarine 8
substance 7
success 7
sugar 4
suit 5
suitcase 6
sum 4
summer 2
sun 2
Sunday 2
sunlight 8
sunrise 7
sunroom 6
sunset 7
sunshine 7
supermarket 6
supper 4
supply 5
support 7
surf 8
surface 5
surprise 3
swamp 7
sweater 7
sweet 3
swim 2
swimming 2
swing 3
switch 6
sword 7
system 7

T

T.V. 2
table 1
tablecloth 8
tack 8
tadpole 5
tag 5
tail 3
tale 5
talk 2
tan 8
tank 5
tanker 8
tap 4
tape 5
tar 6
target 6
task 8
taste 5
tax 7
taxi 6
tea 1
teacher 1
teacup 7
team 3
teapot 4
tear 8
teaspoon 8
teeth 3
telegram 8
telephone 3
telescope 6
television 3
telly 4
temper 8
temperature 7
ten 2
tennis 5
tent 3
term 6
test 4
textbook 7
thanks 2
theatre 6
theft 6
thermometer 8
thief 7
thing 1
third 2
thorn 7
thought 2
thousand 2
throat 6
throne 6
throw 3
thumb 7

thunder 6
Thursday 2
tick 6
ticket 3
tide 7
tie 5
tiger 5
timber 7
time 1
tin 4
tip 3
tire 6
title 7
toast 5
tobacco 8
toe 5
toffee 8
togs 5
toilet 7
Tokelaun 6
tomato 6
ton 8
Tongan 6
tongue 7
tonne 8
tonsils 7
tool 4
tooth 3
toothache 8
toothbrush 8
toothpaste 8
top 2
torch 5
total 7
touch 5
tour 6
tourist 8
tournament 8
towel 6
tower 6
town 1
toy 1
toyshop 7
track 3
tractor 5
trade 8
traffic 6
trail 5
trailer 7
train 2
tramp 7
trampoline 8
transistor 7
trap 4
trash 7
traveller 8
tray 6
treasure 4
treat 5
tree 1
trial 8
triangle 7
tribe 5
trick 4
tricycle 6
trike 5
trip 2
trouble 3
trousers 7
trout 7
truck 3
trunk 5
trust 8
truth 6
tub 7
tube 7
Tuesday 2
tummy 6
tune 7
tunnel 5
turkey 6
turn 2
turning 7
turnip 8
turtle 8
twig 8
twin 5
type 4
typewriter 6

U

umbrella 7
umpire 6
uncle 2
uniform 7
union 8
unit 6
United States 4
universe 8
university 7
use 2

V

vacation 6
valley 4
value 8
van 4
variety 7
vase 7
vegetables 5
verse 6
vet 6
victory 7
video 6
view 6
village 4
vine 5
violin 7
visit 2
visitor 3
vitamin 8
voice 2
volleyball 8
vote 7
voyage 7

W

wage 8
wagon 4
waist 8
wait 2
walk 1
wall 2
wallpaper 6
war 2
wardrobe 7
wash 2
wasp 8
waste 6
watch 2
water 1
waterfall 8
watermelon 7
wave 5
wax 8
way 1
wealth 7
weapon 7
weather 2
web 7
wedding 5
Wednesday 2
weed 7
week 1
weekend 6
weight 6
welcome 7
well 3
west 3
whale 5
wharf 5
wheat 4
wheel 4
wheelbarrow 7
while 1
whip 7
whisker 6
whisper 6
whistle 5
whitebait 6
widow 7
width 7
wife 2

wilderness 6
will 2
willow 8
win 2
wind 2
window 1
wine 7
wing 5
winner 7
winter 2
wire 5
wish 1
witch 4
wizard 6
wolf 5
woman 2
wonder 4
wood 2
wool 4
word 2
word-processor 6
work 1
worker 6
workshop 7
world 2
worm 4
worry 5
worth 5
wound 7
wreck 7
wrist 6
writer 6
writing 2

X

x-ray 7
Xmas 3

Y

yacht 6
yard 6
year 1
yell 6
youth 8

Z

zebra 8
zero 6
zone 7
zoo 4

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